

Claims

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Grain 3 1. Electromechanical drive element, in particular for the exact positioning of
4 an object in the nanometer to centimeter range, comprising a rotor (11)
5 supported in a bearing element and at least one piezoelectric element (18) that
6 can be acted upon with an electric voltage, characterized in that the bearing
7 element (12, 13, 14) comprises at least one rotor receptacle (16) supported on a
8 bearing block (15) in a fashion that allows it to be rotated with limits, which rotor
9 receptacle (16) can be rotated by the expansion and/or contraction—induced by
10 an electric voltage—of the at least one piezoelectric element (18).

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12 2. Drive element according to Claim 1, characterized in that the rotor (11) is
13 supported in the at least one rotor receptacle (16) in a fashion that allows it to be
14 rotated with friction.

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16 3. Drive element according to Claim 1 or 2, characterized in that the at least
17 one rotor receptacle is a bearing ring (16) that is supported on the bearing block
18 (15) by way of multiple fixed members.

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20 4. Drive element according to one of the Claims 1 through 3, characterized in
21 that the bearing element (12, 13, 14) has two bearing rings (16) as rotor
22 receptacles supported on bearing blocks (15) by way of multiple fixed members
23 (17) in which the ends (11.1, 11.2) of the rotor (11) are supported, whereby at
24 least one of the bearing rings (16) can be rotated by means of at least one
25 piezoelectric element (18).

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107 27 5. Drive element according to one of the Claims 1 through 3, characterized in
28 that the bearing element (12, 13, 14) has a piezoelectrically driven bearing ring
29 (16) to accommodate one end (11.1) of the rotor (11), and a lower-friction
30 abutment for the other end (11.2) of the rotor (11).

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1 6. Drive element according to one of the Claims 2 through 5, characterized in
2 that the friction between the rotor (11) and the at least one rotor receptacle (16)
3 is such that the rotor (11) does not follow relatively rapid revolutions of the at
4 least one rotor receptacle (16), but follows relatively slow revolutions of the at
5 least one rotor receptacle (16).

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7 7. Drive element according to Claim 6, characterized in that the electrodes of
8 the at least one piezoelectric element (18) are connected to a saw-tooth voltage
9 generator that generates alternating slow and rapid expansions and contractions
10 of the at least one piezoelectric element (18) and, therefore, revolutions of the at
11 least one rotor receptacle (16), whereby the rotor (11) follows the slow
12 revolutions and does not follow the rapid revolutions.

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14 8. Drive element according to one of the Claims 1 through 7, characterized in
15 that the rotor (11) has tapering ends.

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17 9. Drive element according to Claim 8, characterized in that the rotor (11)
18 has ends designed in the shape of spherical cups.

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